

General observations – all students should make the following observations:

1. Record the date and time of visit.
2. Describe your study location in words, drawings, and photographs. Be accurate and creative.
3. Find accurate latitude and longitude coordinates of your study location.
4. Record the high and low temperature, rainfall, and UV index of the day of your visit.

Plant observations – choose 4 of the following 7 plant measurements to record/observe.

1. **Flower measurements.** Find a flower and measure its width. Count the petals. (What kind of animal pollinates this plant?)
2. **Above vs. belowground biomass.** Pull up a small plant with roots intact. Shake off as much soil as possible. Find the mass of the aboveground portions and compare to the mass of the belowground portions.
3. **Surface area to mass ratio.** Choose two leaves with different thicknesses. Trace each on the 1cm² grid below and estimate each one's surface area. Find each leaf's mass. Compare the surface area to mass ratio for each leaf.
4. **Rip-o-meter.** Using these same two leaves, use the rip-o-meter to test strength.
5. **Seed dispersal.** Find a baby plant (preferably a baby tree). What parent tree did this baby probably come from? Measure or estimate the distance between parent and offspring. (What kind of animal or force could have moved this seed?)
6. **Plant abundance.** Choose a common species of small plant. Count the number of these plants you see within a 2-meter radius.
7. **Biodiversity.** Count the number of different plant species you can see from one spot. Group your counts into: canopy trees, understory trees, bushes/shrubs, herbs/grasses

Animal observations – choose 4 of the following 5 animals measurements to record/observe.

1. **Belowground insects.** Using a spade or trowel, pick up soil 6 inches deep in one scoop, so that you capture any insects that might be hiding beneath the ground. Dump this soil into a container; what did you find? Count the number of different species.
2. **Damage to plants.** Examine some plants in your area. Do any of them seem to have damage done to them by animals? Examples might include torn leaves on plants, trampled plants, or plants which otherwise look as if they may have been fed on or destroyed in some way. (What animal might have been responsible for this damage?)
3. **Animal Droppings/Tracks.** Though none may be evident, check your area for evidence of animals such as tracks or animal droppings. Should you find any tracks, draw a sketch and write a description. Should you find droppings, a description will suffice.
4. **Biodiversity.** Count the number of animal species (insects and otherwise) that you are able to observe in your area.
5. **Traits of animals.** Draw a sketch of any animals you see and describe 5 of their traits. Note specialized/unique structures and interesting colorations.

Journal Entry #2: Describe something you saw today that you have never seen before. It could be a new species or a new attribute/behavior of a species you know well. (*approx. 1 page double spaced*)

General observations – all students should make the following observations:

1. Record the date and time of visit.
2. Describe your study location in words, drawings, and photographs. Be accurate and creative.
3. Find accurate latitude and longitude coordinates of your study location.
4. Record the times and heights of high and low tide, surf height, and UV index of the day of your visit.

Plant observations – choose 4 of the following 5 plant measurements to record/observe.

1. **Anatomy.** Choose two interesting species of aquatic plants. Sketch them. Identify the different body parts each has.
2. **Salinity.** Choose two tidepools or other areas with obviously different plant species. Count the number of species in each area, then taste the water and compare the salinity.
3. **Herbivores.** Choose one tidepool (or other confined area) that contains plants and fish and one tidepool with just plants. Estimate the percent of plant coverage in each location.
4. **Plant abundance.** Choose a common species of plant. Count the number of these plants you see in one tidepool or in three dives.
5. **Biodiversity.** Count the number of different plant species you can see in a 1m² area. Group your counts into: green algae, red algae, brown algae, blue-green algae (cyanobacteria)

Animal observations – choose 4 of the following 8 animals observations to record.

1. **Classification.** Try to identify as many species as you can in your area. If you come to something you are not sure of, how will you identify it? For example, if you come across some pink spongy substance clinging to a rock, how can you determine if this is an animal, plant, or something else?
2. **Species diversity.** Set up a 1m² area using string, then count the number of different species.
3. **Organism density.** Within a 1m² area, count the number of organisms of the same type. Compare densities in different areas – for example, are there more opihi on top of rocks or lower down on rocks? Does one species tend to dominate certain areas or zones?
4. **Physical traits.** Describe the characteristics of different organisms. Note specialized/ unique structures. Also observe coloration. Do the colors of certain organisms change? Draw connections between the physical traits an organism possesses and how it uses those structures to function.
5. **Use of space.** Where are your organisms found? Are they found above the water, below the water, or both? Do you see a preference? Do you see evidence of competition for space between different organisms? If you think so, what are you basing this on?
6. **Geography/zonation.** Do you see distinct zones in your area? If you think there are zones, what are you basing that on? Does the topography appear the same throughout your area? Is the water level the same in all areas? Describe the substrate found there. Is it mostly lava rock? Sand? Silty bottom?
7. **Behavior.** Observe the behavior of several different species over a specific increment of time (*e.g.* 5 minutes). Note if your organism appears to be eating, hiding, running, swimming, defending itself, defending its territory, etc.
8. **Movement.** How do different species get around? What structures do they possess that enable movement? Or are some species sedentary (that is, stuck to one location)?

Journal Entry #2: Describe something you saw today that you have never seen before. It could be a new species or a new attribute/behavior of a species you know well. (*approx. 1 page double spaced*)